Controlled Remodeling around Dental Implants with Transmucosal Interface Design (healing/final abutment) in posterior immediate implants

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Abstract

Remodeling of peri-implant bone and soft tissue after placing an implant is a normal physiological process. This will depend on number of factors, one of which is the design of transmucosal interface. In this study, we have used titanium gingival formers as healing abutment and re-inforced PEEK (Biohpp Elegance - Bredent Medical, Germany) as a final abutment on bone level implant system (Sky - Bredent Medical, Germany). This was installed in 20 cases of posterior immediate implants on human where 14 cases have 1 year post operative cbct and remaining 6 are yet to complete 1 year. All the cases have completed 8 months after loading and have minimum prosthetic height of $\leq 5\text{mm}$.

Measurement showing mean value of the Buccal and lingual bone in millimeters :

	Day of Surgery	After 1 year
Buccal	3.65	2.23
Lingual	3.48	2.73

Background and Aim

Stability of peri implant tissues have been the most important prerequisite for long term success of dental implants. It is the bone and soft-tissue that hold the dynamic structure of implant fixture and the prosthetic frame. Aim of this study is to observe how we can use the trans-mucosal interface design to guide the peri implant complex of hard and soft tissue around posterior immediate implant to the desired optimum level for optimal peri implant seal for long term success.

Methods and Materials

Materials used were titanium healing abutments of 45 degrees (7mm dia - Large) and ≤ 15 degree (5mm dia - Medium) divergence on bone level implants of 4.5mm diameter (length of 8 - 10mm) with implant platform of 0.5mm machined surface height. ISQ measurement was done by RFA device (Penguin - Bredent, Germany).

Method: Mandibular 1st molars were extracted and implants of 4.5mm diameter were placed with the osteotomy between the roots. Implants were placed 3 to 4mm subcrestal and large healing abutment was placed after measuring ISQ of ≥ 65 . The gap between the implant and the socket wall was filled with deproteinized bovine bone graft materials (DBBM - Geistlich). IOPA Radiographs with paralleling technique were taken on the day of surgery and 6-8 weeks after surgery. Once the gap of 2 mm between trans-mucosal surface and remodelled crestal bone were observed, medium healing abutment was placed. Clinical and radiographic examination were done at 2, 4, 8, 16 and at 52 weeks. CBCT was taken 1 year post operatively to observe crestal bone stability.

Prosthetic space of less then 4mm

Results

Results showed, with the help of controlled remodeling, it is possible to guide peri implant complex to desired post-operative stability. One year post operative follow up showed peri implant tissues were stable. Crestal bone were observed at level or slightly more than the implant platform. Smaller diameter healing abutment may allow the soft tissue to form on top of crestal bone adjacent to implant platform. We observed that maintaining biologic width we can guide the peri implant tissue to the desired level in posterior immediate implant treatment for optimum seal and stability of peri implant complex which will help in long term stability and success.

Conclusion

Controlled remodeling is possible with the use of transmucosal surface (healing abutment) of varying degree of divergence and width in posterior immediate implants. Clinically we save on treatment time and number of surgical interventions which in turn will reduce the patient morbidity but increase the patient acceptance and comfort to treatment.

References

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